Pathology team

Neoplasia L2

Green: notes by the doctor

Red: important

Blue: explanation

Black: from the slides

What's the difference between BENIGN& MALIGNANT tumors?

	Benign tumors	Malignant tumors
Differentiation	-well differentiated Exactly similar to the original cell خلايا الورم تشابه الخلايا الاصلية	-well differentiated -Moderately differentiated -Poorly differentiated -Undifferentiated (Anaplasia) مختلفة تماما عن الخلايا الاصلية The Most aggressive .
Rate of growth	-grows slowly -affected by blood supply, hormonal effects , location (يتأثر حجمها بالهرمونات, مثال: المرأة الحامل يزيد حجم الورم لديها بسبب افراز هرمون الاستروجين وبعد الولادة يصغر حجمه)	-grows faster -Correlate with the level of differentiation *it may start slowly then rapid growing
Local invasion	Remain localized Cannot invade Usually capsulated	Progressive invasion Destruction Usually not capsulated
Metastasis	nonmetastatic	Metastatic

Morphology:

Benign: have **regular** boundaries.

Malignant: have **irregular** boundaries

Differentiation : the extent to which the parenchymal cells of the tumor resemble their normal counterparts morphologically and functionally.

هي مدى تشابه خلايا الورم و الخلايا الطبيعية في الشكل والوظيفة.

Well differentiated : closely resemble their normal counterparts

*Exactly similar to the original cells

Metastasis: the development of secondary implants discontinuous with the primary tumor, possibly in remote tissues

مثل أن يكون الورم في القولون فتنتقل الخلايا الى اماكن بعيده مثل الكبد وتزرع نفسها هناك

-four sites for metastasis, bone, lung, liver and brain

-Glioma(ورم الدماغ)doesn't metastasis.

بمعنى ان اذا كان فيه ورم بدماغ لن ينتقل لاماكن بعيده لكن اذا ورم في مكان ثاني ممكن ينتقل للدماغ

-Approximately 30% patients present with clinically evident metastases.

-Generally, the more anaplastic and the larger the primary tumor, the more likely is metastasis

كل ما كان الورم كبير كل ما كان فرصه حصول المتاستاسيس اكبر

Metastasis is the most important criteria to differentiate between benign and malignant tumors

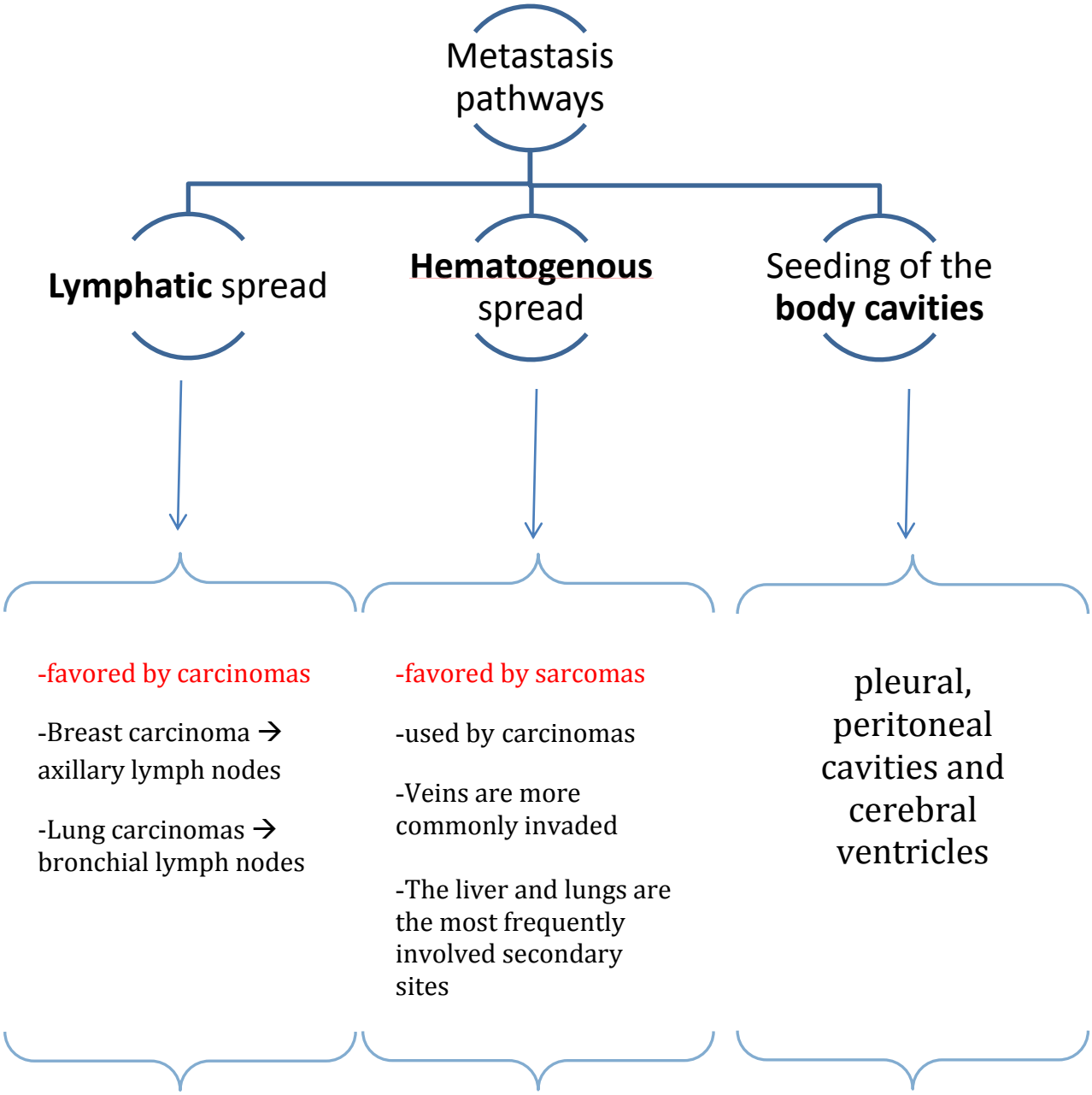
In the histological examination of a tumor you should look for :

-Pleomorphism : variation in size تغير الحجم

-High nuclear/ cytoplasm ratio (N/C ratio) (increase in the ratio of nucleus to cytoplasm)

-Hyperchrmasia (dark cell) .(variation in the color of the cell)

-Mitosis, abnormal one (الخليه تنقسم الى ثلاث خلايا او اكثر بدل ان تنقسم الى خليتين)


Metastasis pathways
Lymphatic spread
Hematogenous spread
Seeding of the body cavities
-favored by carcinomas
-Breast carcinoma → axillary lymph nodes
-Lung carcinomas → bronchial lymph nodes
-favored by sarcomas
-used by carcinomas
-Veins are more commonly invaded
-The liver and lungs are the most frequently involved secondary sites
pleural, peritoneal cavities and cerebral ventricles

Dysplasia : a loss in the uniformity of the individual cells and a loss in their architectural orientation, Non-neoplastic

Occurs: mainly in the epithelia

Dysplastic cells shows a degree of :

pleomorphism, hyperchrmasia , increased mitosis and loss of polarity.

Dysplasia does not mean cancer, does not necessarily progress to cancer.

-Dysplasia may be **reversible**

-If dysplastic changes involve the entire thickness of the epithelium it is called :CARCINOMA IN-SITU

-dysplasia is a pre-neoplasm

Clinical significance:

-It is a premalignant condition.

-The risk of invasive cancer varies with:

1- grade of dysplasia (mild*part*, moderate, sever)

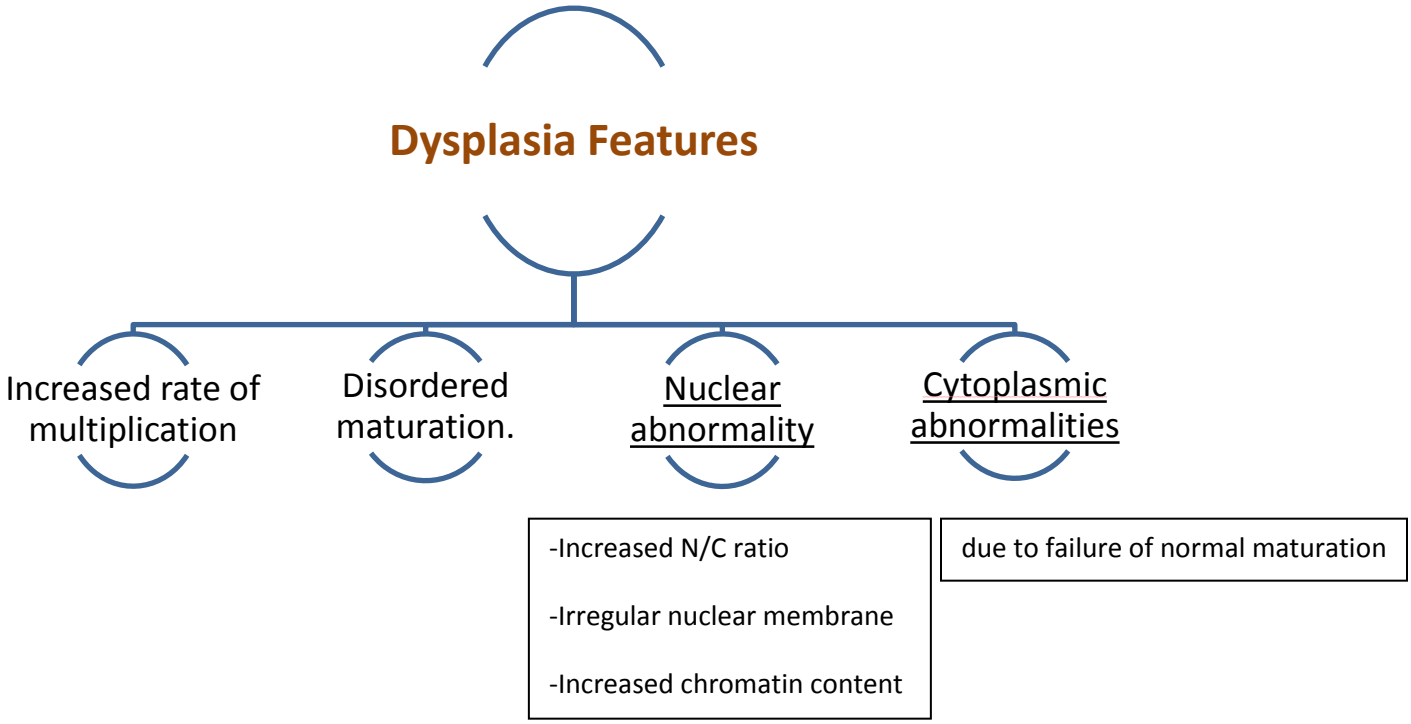
2- duration of dysplasia

3- site of dysplasia

What's the difference between dysplasia and cancer?

-lack of invasiveness (doesn't penetrate the basement membrane)

-Reversibility



***if we find all these features we call it severe dysplasia**

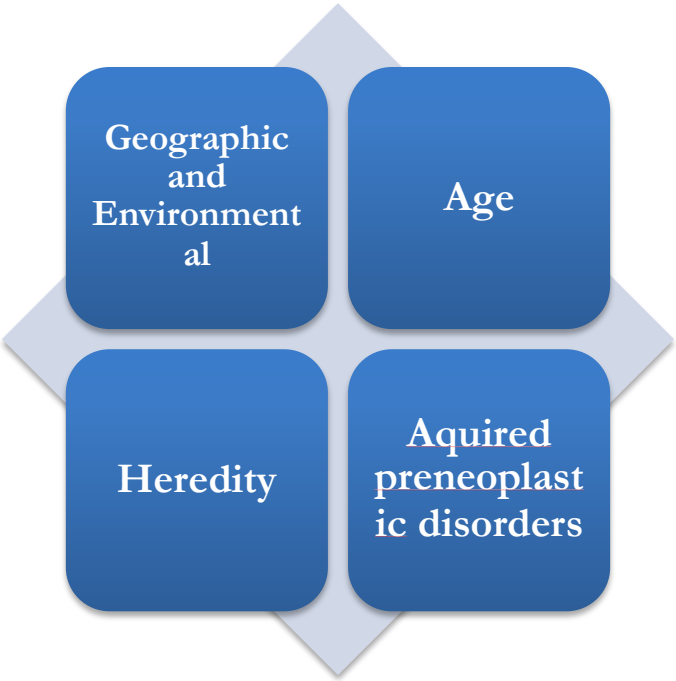
Carcinoma in-situ :an intraepithelial malignancy in which malignant cells involve the entire thickness of the epithelium without penetration of the basement membrane.

-Applicable only to epithelial neoplasms

-A true neoplasm with all of the features of malignant neoplasm **except invasiveness**

- **The benefits of Epidemiology:**
  - Will help to discover aetiology (aetiology means cause of disease)
  - Planning of preventive measures
  - To know what is common and what is rare.
  - Development of screening methods for early diagnosis

Factors affecting incidence of cancer



- **Geographic and Environmental factors:**
  - Rate of stomach carcinoma in Japan is seven times the rate in North America and Europe.
  - Breast carcinoma is five times higher in North America comparing to Japan
  - Liver cell carcinoma is more common in African populations
- **Geographic and Environmental factors:**
  - Asbestos : mesothelioma
  - Smoking : lung cancer
  - Multiple sexual partners: cervical cancer
  - Fatty diets : colonic cancer

Asbestos: is a set of six naturally occurring silicate minerals used commercially for their desirable physical properties, The prolonged inhalation of asbestos fibers can cause serious illnesses[2] including malignant lung cancer ,mesothelioma, and asbestosis.

- **Age:**
    - Generally, the frequency of cancer increases with age.
    - Most cancer mortality occurs between 55 and 75.
    - Cancer mortality is also increased during childhood
    - Most common tumors of children: Leukemia, tumors of CNS, Lymphomas, soft tissue and bone sarcomas.
- **Heredity**
    - Inherited Cancer Syndromes
    - Familial Cancers
    - Autosomal Recessive Syndromes of Defective DNA repair

- **Inherited Cancer Syndromes:**
    - Inheritance of a single mutant gene greatly increases the risk of developing neoplasm
    - E.g. Retinoblastoma in children :
        - 40% of Retinoblastomas are familial
        - carriers of the gene have 10000 fold increase in the risk of developing Retinoblastoma
    - E.g. multiple endocrine neoplasia

      (There is a clear explanation in neoplasia lecture 3)

- **Familial Cancers:**
    - All common types of cancers occur in familial form
    - E.g. breast, colon, ovary,brain
    - Familial cancers usually have unique features:
        - Start at early age
        - Multiple or bilateral
        - Two or more relatives

- **Autosomal Recessive Syndromes of Defective DNA repair :**

- Small group of autosomal recessive disorders
- Characterized by DNA instability

- **Aquired preneoplastic disorders: Some Clinical conditions that predispose to cancer:**

- Dysplastic bronchial mucosa in smokers→ lung carcinoma
- Liver cirrhosis → liver cell carcinoma
- Margins of chronic skin fistula → squamous cell carcinoma